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The Coastal Plainer

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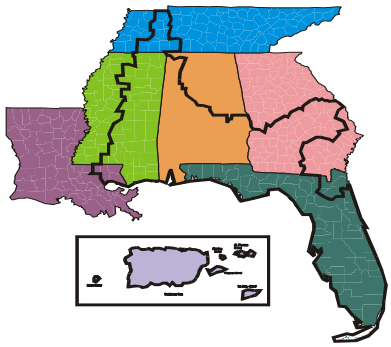
Points from Puckett

by William E. Puckett, SSS/ MO Leader, Auburn, AL

This is my last column as Team Leader for MO–15 and State Soil Scientist for Alabama. I accepted a job as the Director of the Soil Quality Institute and started my new job on September 24, 2001. I did not have to move far, just a few miles, but the differences between the jobs are night and day. I am now at the National Soil Dynamics Laboratory (an Agriculture Research Service facility), which is located on campus at Auburn University.

This was not a decision that I made lightly, the last two years serving you in MO–15 have been very special. I met some great people and made many new friends. I want to express my appreciation for your kindness and willingness to accept new challenges. The lessons I learned during my short tenure at MO–15 will be very valuable to me as I move toward my career goals. I hope you all have a clear vision of your career goals and that you make every effort to achieve those goals.

MLRA Soil Survey Region #15



The opportunities for soil survey and technical soil services are wide open, and all we have to do is capitalize on those opportunities. I know our work force is depleted and a new-hire soil scientist is a rare thing, but we must continue to expand our reach in soil science. Our science is expanding into many new and challenging areas, but the one fundamental truth is that our soils information will never be any better than the soil survey that was made on-the-ground by hard working, dedicated soil scientists. And even though we are moving into a day and age of more sophisticated computer models, they will never replace what our soil scientists know about soils. The difference will always be in how we tell the story about soils and how we transmit our knowledge to others.■

Mapping Soils in the Great Smoky Mountains National Park

From "NRCS This Week," July 20, 2001.

This month, NRCS, the National Park Service, and the University of Wisconsin will pilot a 2-year soil mapping project in the Great Smoky Mountains National Forest using SoLIM (see May 18, 2001 edition of NRCS This Week). SoLIM is a computer generated soil-landscape

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Soil Science Consulting

By Bob Kendall, Registered Professional Soil Scientist

Soil scientists have been active in environmental consulting for many years. I took a consulting job 22 years ago straight out of graduate school at the University of Georgia. At that time the group I was working with at Law Environmental was doing soil and groundwater investigations for permitting land application of municipal and industrial wastewater. We mapped soils, performed field permeability tests, collected soil samples for chemical analyses, and supervised installation of shallow monitoring wells. Data analyses were performed to develop hydrologic and nutrient balances and to evaluate groundwater flow patterns.

Soil science by its very nature is multidisciplinary. Physics, chemistry, biology, geology, geography, climatology, hydrology, engineering, and surveying each play an important part in the education and training of soil scientists. With this kind of education, soil scientists are uniquely qualified to perform certain kinds of work and generally qualified to do many kinds of work. An excellent way for a soil scientist to get exposed to different specialties in consulting is to work for an environmental consulting firm. Opportunities often arise to work on interdisciplinary teams for a wide range of clients and to get to see how different types of projects are set up and run.

"The consulting world has opened up tremendously for soil scientists in the past 20 years."

The consulting world has opened up tremendously for soil scientists in the past 20 years. Land application of wastes from Concentrated Feeding Operations (CFO's) is a relatively new area in which federal and state regulations have created opportunities for soil scientists. Sediment and erosion control is one of the hottest fields in which soil scientists are working due to the emphasis on Total Maximum Daily Load (TMDL) assessments. Onsite wastewater disposal continues to provide a large volume of work in some states. Wetland delineation and permitting has been an active area for the past 10 to 12 years. In addition to these areas, soil scientists have been involved in a wide array of environmental and natural resource management and planning activities that don't necessarily require expertise in soil science.

One of the best ways to learn about opportunities in soil science consulting is to join a professional organization, such as the National Society of Consulting Soil Scientists (NSCSS). I must admit I have a bias toward this particular organization due to the fact that I currently serve as the Chairman of the Board of Directors. Attending the annual meeting and serving on a committee are excellent ways to network with other soil science consultants who make their living providing consulting services to public, private, and institutional clients. I am always amazed at the scope of services that our members provide and the number of very large corporations that hire our members. I encourage anyone interested in soil consulting to check out NSCSS through our web site at www.nscss.org. Consulting is a great way to use your knowledge, help solve problems, and make a good living.■

Houston County Soil Survey Update

By John L. Burns, Soil Scientist, Auburn, AL

A soil survey update for Houston County, Alabama, has been underway since January 2000. Most of the fieldwork for the original survey was done in the late 50's and early 60's, and the original survey was published in February 1968. The Dothan City Council and the Houston County Soil and Water Conservation District Board initiated and are supporting the update.

Mapped as the miscellaneous area "Swamp," areas such as these are being recorrelated to Dorovan, Byars, and Grady soils, 0 to 1 percent slopes, ponded.

A soil survey update is conducted for several reasons, including:

* To bring the existing soil survey up to current standards of the National Cooperative Soil Survey and to better meet the needs of soil survey users[1];
* Soils do not change much over 40 to 50 years, but the way soil scientists interpret soils does change (the classification system is updated every 2 years);
* Older surveys commonly concentrated on agricultural land and did not provide as much detail for wooded or poorly drained areas;
* Timber and paper companies have begun to manage their land for maximum productivity, much like a farmer in Houston County manages his own land[2], therefore, the companies need more accurate and updated soils information;
* In older surveys, miscellaneous areas were commonly mapped where a soil series was not named. For example, in Houston County a miscellaneous unit called Swamp (SW) was mapped—such mapping does not give the detailed soils information that is necessary for sound environmental management;
* New digital photography enables the soil scientist to draw more accurate lines and allows the soil survey to be published on CD and on the Internet as well as in hardcopy book form;
* The electronic or digital format also allows the survey to be used in a Geographic Information System (GIS), such as "ArcView" software;
* Updated soils interpretations allows for better planning by city and county officials;
* Urban sprawl of cities, including Dothan, can grow faster than the city sewer and water systems; therefore, updated soil data is important for installing septic systems; and
* People are more aware of the role soils play in environmental protection.

A soil survey update mainly involves data collection by way of transects. Transects are usually a line of 10 points across a map unit. They are conducted with a soil auger, boring down 5 to 6 feet below the surface. They allow the soil scientist to evaluate the soil map unit and the composition of the soils in the unit. Commonly, a map unit consists of two or three soil series. Such a unit is called a complex.

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To date, update activities in Houston County have been concentrated in such areas as the river terrace and drains. Changes in the mapping of the Alaga soil series are an example of an update activity. The Alaga series was originally mapped on uplands and the river terrace. The series should mainly be mapped on uplands and not on the river terrace. The Kenansville series is replacing the Alaga series on the river terrace. The morphology of the Kenansville soil better fits the river terrace situation and allows for rare flooding, whereas the Alaga series does not.

The Houston County soil survey update will have a world of advantages to all types of users. From the 9th grader working on a class project to the seasoned professional, users will have easy access to the soil survey update for what they need. No, the soils don't change very much over 40 to 50 years, but technology advances, population growth occurs, and the way we use and interpret soil information changes.

[1] Houston County Soil Survey Update, Memorandum of Understanding; December 1, 2000

[2] Soil-Specific Pine Plantation Management, by John Torbert; The Coastal Plainer, Summer 2001, Vol. 6, No. 3.■

Global Warming… Shuck and Jive, or The Real Deal?

By Mike Lilly, State Soil Scientist, Jackson Mississippi

Is the earth's climate getting warmer? Yes. Are human activities contributing to global warming? Probably. Are other factors affecting global warming? You bet! How can we make sense of all this?

Measurements collected since Cold War submarines prowled under the arctic ice show that the ice cap is getting thinner. In the Himalayas, the Andes, and other middle-latitude mountains, glaciers are receding; other glaciers, however, in high latitudes like Scandinavia, are expanding. Is this phenomenon human-influenced global warming or a natural cycle...or both?

Geologists have long believed that the earth's climate is cyclic. They point to the advances and retreats of the glaciers during the Pleistocene. Most scientists believe we are in an interglacial period now. Astrophysicists will tell you some of the changes to the climate are caused by variations in the earth's orbit. If these beliefs are accepted, we can quite easily conclude that the warming of the earth is a natural event and that there is nothing we can do about it. This is partially true, but we have all heard of the depletion of the ozone layer caused by our indiscriminant use of the dreaded aerosol and other nasty human-created gremlins.

So, how much of the climate change can be attributed to natural events and how much to human-induced factors? The jury is still out on this one. It depends on which "expert" you ask. So what are we to believe? More importantly, what are we to do? The natural warming of the earth is something we have no control over. We do, however, have control over many of the human-induced factors. It's these factors that we need to focus on. The general consensus of the Kyoto Protocol is that we should do something to reduce greenhouse gas emissions. Some of the things we can do to help include insulating our homes, buying energy efficient automobiles and appliances, using a composting lawnmower, recycling, car pooling, using alternate forms of transportation, and most importantly, educating others. Global warming is here, and we need to face it. Individuals should realize that collectively we can make a difference.■

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model (under development) that captures existing soil and environmental knowledge, creates data layers for input into a GIS, and produces soil maps. It also provides the potential for the use of "fuzzy soil logic" in the development of soil-landscape based interpretations. During the first year of the project, the SoLIM approach will be applied to produce a soil map in an area recently mapped by soil scientists in Tennessee and North Carolina. During the second year, information developed using the SoLIM approach will be used to map an adjacent area where there is currently no soil survey information. Results of the 2-year project will provide the basis for assessing whether to adopt SoLIM techniques for mapping soils in remote areas and the program's performance overall.

Using models to assist in producing soil maps and interpretations results in considerable time and cost savings, improves quality and consistency in soil mapping, and allows documentation of soil-landscape knowledge and information acquired by soil scientists. By eliminating time consuming, "low-level" line placement activities, the soil-landscape models provide more time in the field for soil scientists. Your contact is Dr. Sheryl H. Kunickis, NRCS Soil Scientist/Landscape Analyst, at 202-720-6370 or <sheryl.kunickis@usda.gov>.■

The Smokies Are Hot—An Update

By Darwin Newton, State Soil Scientist, Nashville, Tennessee

In the Fall 1998 issue of the Coastal Plainer, I wrote an article entitled "The Smokies are Hot." I realize that article has little to do with mapping the kinds of soils we generally have in MO-13; however, mapping in the Great Smoky Mountain National Park is affording us a unique opportunity to investigate and apply our old and new technologies in a way I feel is beneficial to all soil scientists.

To bring you up to date, after about 2 1/2 years we have mapped about 45 percent of the park (500,000 acres in total). Not too bad for a halfway marker. Mapping is at a scale of 1:24,000 using our conventional tools, such as geology maps, topo's, color photography, etc. We have, however, reached a point in mapping that has moved us with a unique challenge. All of the mapping that has been completed has been in areas of the park that have reasonable accessibility. That is, areas that at least have trails where we can run transects and collect data to the point of an order 2 soil survey. We are now faced with the inaccessibility of many large remote areas of the park. Accessibility is limited by a lack of trails of any kind and by very steep, rocky terrain. Because of this inaccessibility, we've become limited in our observations. Being in an area that has never been investigated, however, we must have some plan to observe and collect data. This situation brings me to the point of outlining our approach for tackling this project.

A little over a year ago, I discussed the situation with Berman Hudson. At that time, Berman was looking at the feasibility of research and development projects dealing with the adaptation of new techniques in the

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soil survey process. One of the technologies included the utilization of a Geographic Information System (GIS) as an integral part of the mapping process coupled with the use of knowledge extraction techniques to develop automated soil mapping decision support systems. At this discussion, Berman indicated Dr. A-Zing Zhu at the University of Wisconsin was currently working with NRCS on this approach to mapping in Dane County, Wisconsin. This technology automates much of the mapping process. It extracts a knowledge base from a soil scientist and uses an inference engine to produce soil maps by relating the knowledge base to a GIS "library."

Following several discussions and planning meetings, NRCS and the U.S. Park Service entered into an agreement to evaluate Dr. Zhu's technology for use in the remote areas of the park. Dr. Zhu made his first visit to the park a few weeks ago and worked with the field soil scientist to apply the new technology to an area that had been previously mapped. From the knowledge extraction and GIS model developed, a map that impressed everyone involved was developed. Thus, the groundwork has been developed for the test of this project.

As stated earlier, a knowledge base is required to fuel the inference engine. This is our largest challenge. Personnel from NRCS and the U.S. Park Service are going to have to visit some of the more remote areas of the park. As of now, only photography is available. Extended camping trips are planned to observe specific sites and to help collect information for the knowledge base. Later, Dr. Zhu will use the information to assist in developing a map of these areas.

We realize there are many challenges from the perspective of the soil scientist and for the inferences we draw. However, we must seek out ways to provide meaningful data to our users. As the project progresses, I will keep you updated on how data is collected and interpreted and on our level of confidence under these extraordinary conditions and challenges. We always need to use meaningful measures to enhance and accomplish our mission. I feel this survey area provides us a unique opportunity to investigate and apply new approaches to our work.■

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Information regarding the new NRCS logo is available online at:

http://www.nhq.nrcs.usda.gov/CCS/nrcslogo.html.